TABLE 1.—*Free-air temperatures, relative humidities, and vapor pressures during November, 1924*—Continued

RELATIVE HUMIDITY (%)

Altitude m. s. l. (m.)	Broken Arrow, Okla. (233m.)		Drexel, Nebr. (396m.)		Due West, S. C. (217m.)		Ellendale, N. Dak. (444m.)		Grossbeck, Tex. (141m.)		Royal Center, Ind. (225m.)	
	Mean	Departure from 7-yr. mean	Mean	Departure from 10-yr. mean	Mean	Departure from 4-yr. mean	Mean	Departure from 7-yr. mean	Mean	Departure from 7-yr. mean	Mean	Departure from 7-yr. mean
Surface	55	−11	64	−7	70	+2	68	−11	74	−1	67	−6
250	55	−11			68	+1			71	−1	67	−6
500	52	−10	61	−7	60	−3	67	−10	64	−3	67	−5
750	51	−9	58	−5	57	−3	66	−6	62	−1	66	−3
1,000	50	−8	57	−1	57	−1	64	−3	60	0	66	0
1,250	48	−7	55	0	53	−3	61	−2	57	0	64	+2
1,500	46	−6	53	0	50	−4	58	−1	56	+2	59	+1
2,000	41	−7	48	−2	46	−2	52	−3	49	0	61	+7
2,500	38	−8	46	−4	33	−10	52	−3	25	−18	56	+6
3,000	33	−12	46	−5	32	−9	53	−2	20	−19	54	+6
3,500	27	−14	49	−3	30	−11	53	−3	19	−19	49	+3
4,000	20	−16	52	0	28	−13	56	−2	17	−18	49	+6
4,500	20	−13	52	+2	28	−17			16	−18		
5,000	19	−15	52	+4	28	−17						

TABLE 1.—*Free-air temperatures, relative humidities, and vapor pressures during November, 1924*—Continued

VAPOR PRESSURE (*mb.*)

Altitude m. s. l. (m.)	Broken Arrow, Okla. (233m.)		Drexel, Nebr. (396m.)		Due West, S. C. (217m.)		Ellendale, N. Dak. (444m.)		Grossbeck, Tex. (141m.)		Royal Center, Ind. (225m.)	
	Mean	Departure from 7-yr. mean	Mean	Departure from 10-yr. mean	Mean	Departure from 4-yr. mean	Mean	Departure from 7-yr. mean	Mean	Departure from 7-yr. mean	Mean	Departure from 7-yr. mean
Surface	8.07	−0.12	5.18	−0.58	9.74	+0.36	3.84	−0.62	12.28	+0.47	6.14	−0.46
250	8.02	−0.10			9.53	+0.31			11.79	+0.42	6.07	−0.45
500	7.33	−0.02	5.00	−0.51	8.05	−0.12	3.71	−0.67	10.62	+0.37	5.38	−0.43
750	6.62	−0.10	4.56	−0.42	7.13	−0.18	3.47	−0.59	9.66	+0.44	4.89	−0.34
1,000	6.02	−0.20	4.35	−0.21	6.44	−0.26	3.30	−0.46	8.59	+0.24	4.40	−0.25
1,250	5.46	−0.22	4.14	−0.10	5.59	−0.43	3.18	−0.31	7.34	−0.07	3.92	−0.21
1,500	4.95	−0.15	3.83	−0.09	4.72	−0.68	3.03	−0.20	6.43	−0.17	3.55	−0.13
2,000	3.79	−0.27	3.07	−0.16	3.57	−0.57	2.55	−0.18	4.78	−0.29	3.17	+0.16
2,500	2.93	−0.30	2.61	−0.10	1.98	−1.29	2.12	−0.20	2.10	−1.67	2.76	+0.37
3,000	2.05	−0.57	2.19	−0.09	1.31	−1.31	1.75	−0.17	1.15	−1.59	2.41	+0.29
3,500	1.35	−0.60	1.88	0.00	0.61	−1.64	1.35	−0.21	.89	−1.24	1.90	+0.19
4,000	0.80	−0.52	1.61	+0.07	0.29	−1.51	1.01	−0.29	.65	−0.86	1.56	+0.72
4,500	0.68	−0.25	1.24	+0.06	0.19	−1.44			.52	−0.50		
5,000	0.53	−0.23	0.96	+0.09	0.11	−1.44						

TABLE 2.—*Free-air resultant winds (m. p. s.) during November, 1924*

Altitude, m. s. l. (m.)	Broken Arrow, Okla. (233m.)				Drexel, Nebr. (396m.)				Due West, S. C. (217m.)				Ellendale, N. Dak. (444m.)				Groesbeck, Tex. (141m.)				Royal Center, Ind. (225 m.)			
	Mean		7-year mean		Mean		10-year mean		Mean		4-year mean		Mean		7-year mean		Mean		7-year mean		Mean		7-year mean	
	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.
Surface	S. 54° W.	3.4	S. 48° W.	1.3	S. 80° W.	2.4	S. 82° W.	1.5	S. 67° W.	0.8	N. 73° W.	0.7	N. 57° W.	3.6	N. 52° W.	2.3	S. 2° E.	1.4	N. 64° E.	0.2	S. 61° W.	3.8	S. 46° W.	1.9
250	S. 55° W.	3.4	S. 45° W.	1.4					S. 63° W.	1.2	N. 73° W.	0.7					S. 4° W.	2.8	S. 68° W.	0.5	S. 57° W.	4.2	S. 54° W.	2.7
500	S. 58° W.	3.9	S. 32° W.	2.4	S. 84° W.	3.2	S. 84° W.	2.1	S. 69° W.	3.4	N. 86° W.	1.5	N. 68° W.	4.1	N. 64° W.	2.6	S. 25° W.	5.5	S. 5° E.	1.2	S. 70° W.	6.4	S. 57° W.	4.8
750	S. 61° W.	4.7	S. 38° W.	3.1	S. 86° W.	5.2	W.	3.7	S. 87° W.	3.7	N. 81° W.	2.1	N. 67° W.	6.1	N. 64° W.	4.0	S. 29° W.	6.2	S. 22° W.	1.8	S. 72° W.	9.7	S. 63° W.	6.3
1,000	S. 66° W.	5.2	S. 50° W.	3.8	N. 88° W.	7.5	N. 89° W.	5.1	S. 83° W.	4.1	N. 87° W.	2.7	N. 64° W.	7.0	N. 67° W.	4.9	S. 39° W.	7.7	S. 43° W.	2.6	S. 83° W.	9.8	S. 70° W.	6.9
1,250	S. 75° W.	6.2	S. 58° W.	4.6	N. 82° W.	9.2	N. 86° W.	6.1	S. 85° W.	5.5	N. 85° W.	4.0	N. 72° W.	7.9	N. 70° W.	5.9	S. 44° W.	8.2	S. 59° W.	3.1	S. 89° W.	10.3	S. 74° W.	7.7
1,500	S. 77° W.	8.1	S. 66° W.	5.3	N. 82° W.	10.0	N. 86° W.	7.1	S. 85° W.	6.8	N. 88° W.	5.4	N. 59° W.	9.6	N. 65° W.	7.1	S. 51° W.	7.0	S. 67° W.	3.8	N. 81° W.	11.6	S. 78° W.	8.3
2,000	S. 86° W.	9.5	S. 74° W.	6.7	N. 80° W.	11.6	N. 82° W.	8.2	S. 74° W.	9.5	S. 88° W.	7.4	N. 64° W.	11.7	N. 66° W.	8.7	S. 64° W.	7.7	S. 79° W.	5.2	N. 83° W.	13.1	S. 83° W.	9.8
2,500	S. 85° W.	9.6	S. 79° W.	7.3	N. 79° W.	13.8	N. 79° W.	10.0	S. 66° W.	9.8	S. 86° W.	8.9	N. 80° W.	11.9	N. 68° W.	10.8	S. 64° W.	7.8	S. 85° W.	7.1	N. 81° W.	13.9	S. 85° W.	11.4
3,000	S. 80° W.	9.5	S. 7. ° W.	8.7	N. 82° W.	15.1	N. 79° W.	11.2	S. 40° W.	8.6	S. 89° W.	10.0	N. 82° W.	14.0	N. 69° W.	12.9	S. 80° W.	9.6	S. 86° W.	8.5	N. 84° W.	13.9	N. 87° W.	12.7
3,500	S. 74° W.	11.6	S. 78° W.	9.3	N. 79° W.	17.3	N. 76° W.	12.1	S. 26° W.	8.6	S. 87° W.	11.9	N. 71° W.	13.3	N. 67° W.	13.5	S. 79° W.	11.1	S. 76° W.	10.4	N. 84° W.	12.8	N. 86° W.	12.3
4,000	S. 84° W.	12.1	S. 82° W.	11.0	N. 85° W.	19.1	N. 81° W.	13.6	S. 45° W.	14.0	W.	13.9	N. 72° W.	14.8	N. 66° W.	13.1	S. 87° W.	6.5	S. 71° W.	8.5	S. 45° W.	19.0	S. 82° W.	10.4
4,500	N. 60° W.	10.1	N. 85° W.	9.6	N. 87° W.	19.6	N. 85° W.	14.2	S. 45° W.	14.0	N. 87° W.	15.4	N. 68° W.	19.0	N. 61° W.	16.0	S. 77° W.	12.8	S. 67° W.	10.4	S. 45° W.	20.0	S. 79° W.	9.1
5,000	N. 64° W.	10.7	S. 75° W.	11.3	N. 77° W.	17.3	N. 79° W.	13.5	S. 45° W.	14.0	N. 85° W.	14.7												

THE WEATHER ELEMENTS

By P. C. DAY, In Charge of Division

PRESSURE AND WINDS

The anticyclonic conditions persisting so constantly over the Ohio Valley and Northeastern States during October gave way during November, particularly over the more northeastern districts, although the pressure continued high to the southward and anticyclones dominated the weather over the plateau and most other western districts. As a result of this pressure distribution few important cyclones formed over the South or Southwest, and those entering the United States from the Canadian Northwest moved eastward mainly along the northern border.

In the absence of cyclonic disturbances the drought conditions that had set in during October or earlier over many southern and eastern districts continued more or less severe during much of November. The first notable cyclone to give important precipitation to the eastward of the Rocky Mountains moved to the Great Lakes by the morning of the 7th and considerable precipitation occurred in that region in connection therewith, but the storm was quickly dissipated. About the same time, however, some heavy rains occurred over the far Northwest.

Precipitation again occurred in the vicinity of the Great Lakes on the 11th and 12th, due to a shallow depression moving eastward near the northern border. Light precipitation from this depression extended southward into the lower Ohio and middle Mississippi Valleys, and scattered local falls occurred over the Northeastern States. A considerable area of precipitation, though mostly light, extended from the middle and upper Mississippi Valley northeastward and eastward to New England on the 13th and 14th, attending a shallow cyclone that developed over the Ohio Valley on the 13th. About the 18th to 20th material precipitation occurred over the far Northwest, extending into the coast districts of northern California where, in the vicinity of Eureka, the fall was unusually heavy, causing considerable damage to bridges, etc.

The first important precipitation of the month over the Atlantic Coast States occurred in connection with a low-pressure area that moved from North Carolina to New England from the 21st to 23d. Heavy rains occurred in connection with this storm over most of the Atlantic States from Georgia northward, and rains or snows, mostly light, extended westward during the same period into the Ohio Valley and Great Lakes region in connection with a low-pressure area that moved northeastward over the upper Lakes. Light precipitation, mostly snow, occurred on the 24th and 25th over a wide

area from the upper Mississippi Valley eastward and southeastward to the Atlantic coast, and local rains or snows again occurred during the last two or three days of the month from the Great Lakes and Ohio Valley eastward to the coast.

On account of the persistent anticyclonic conditions over the plateau the usual high pressure for that region was materially augmented, and the average pressure was likewise above normal over all southern districts, the ridge of highest averages extending from southern Idaho to the Georgia coast, except that the usual depression on the lee side of the high mountains of Colorado and Wyoming was more pronounced than normal.

Compared with the average pressure for the preceding month there was a sharp fall over all districts from the Ohio Valley and Lake region eastward, and a corresponding rise to the westward and southward.

Due to the general absence of important barometric changes, the pressure gradients were usually small and there were few damaging high winds. The prevailing wind directions conformed mainly to the average pressure distribution, blowing into the low area to northward of the Great Lakes and from the center of high pressure over the Southeastern States and the middle plateau regions, as indicated on Chart VI.

TEMPERATURE

November, like the preceding month, had mainly moderate temperatures, and over the greater part of the country presented few indications of the near approach to winter.

Moderate changes were of rather frequent occurrence over the Great Lakes and nearby areas, and considerable variations were noted in the western mountain districts, but over the Central and Southern States from the Great Plains eastward there were few important breaks in the routine of unusually pleasant weather.

The average temperature for the month as a whole was above normal in all parts of the country save over the far Northwestern States, in extreme southern Florida, and at a few points in the Ohio Valley. Over the Great Plains the monthly averages ranged from 3° to 5° above normal, and in a few localities, particularly in the Southwest, it was the warmest November in 50 years or more.

The important warm periods of the month were mainly during the first few days over the middle and western districts, and generally during the first decade in other portions save over the South Atlantic States, where the highest temperatures were not observed until the 13th and 14th. In a few of the middle Plains States the maximum temperatures during the first few days were among the highest of record for November, and locally in the Lake region the maximum temperatures during the first week were likewise among the highest ever observed in November.

The coldest periods of the month were chiefly near the beginning of the second decade from the Rocky Mountains westward. In the Northeastern States rather severe cold occurred from the 16th to 19th with some record-breaking low readings for November in New York and New England. Over the Gulf and South Atlantic States, the lowest temperatures did not occur until the 25th and 26th, when freezing weather extended to the east Gulf coast and into northern Florida. In the upper Mississippi Valley the lowest temperatures were observed on the 28th and 29th.

PRECIPITATION

The outstanding feature of the weather for November was the widespread and frequently large deficiency in the precipitation. The drought conditions, beginning in October over many eastern and central districts, and even earlier in portions of the lower Mississippi Valley and nearby areas, became more severe as the month advanced, save in local areas, particularly in the Atlantic coast districts where heavy rains from the 21st to 23d gave much relief.

In the middle Gulf States and portions of nearby areas no beneficial precipitation occurred, and many localities had less rain than ever known in November. As October had likewise been a record-breaking month in the matter of least precipitation over much of this area, the combination of two successive months with little or no rain produced drought conditions of the severest type ever known. Much inconvenience resulted from the great lack of water, numerous brush and forest fires occurred and the soil continued too dry for cultivation.

Over many other sections of the country east of the Rocky Mountains the precipitation was also greatly deficient, particularly in New England, the lower Lake region, the Florida Peninsula, and Texas, where as a rule October had likewise been dry.

Considering the precipitation by State units, the averages were everywhere less than normal save for four States in the far Northwest. In California where there had been a long and severe period of drought, the precipitation for the State as a whole was slightly deficient but good rains occurred over most of the State during the first decade though little fell thereafter.

SNOWFALL

Snow occurred over all central and northern sections of the country, though the amounts east of the Rocky Mountains were mainly small except in the Great Lakes region, Ohio Valley, and to the northeastward, where it fell on several dates and the total monthly falls ranged up to 5 inches, with occasional depths of 10 to 15 inches and in a few of the more northern localities to 20 inches.

In the western mountain districts the falls were considerably heavier, and on the whole about what may usually be expected in November.

In California the snowfall was generally light in the Sierra Nevada, and but little remained on the ground at the end of the month. Similar conditions existed in Idaho, New Mexico, Arizona, and Colorado, while in Oregon, Washington, and Nevada there was usually more than the normal fall.

RELATIVE HUMIDITY

There was a general and widespread deficiency in the percentage of relative humidity as compared with the normal, due of course to the unusual lack of rainfall and the excess of dry sunshiny days. The areas of greatest deficiency were mainly between the Rocky and Appalachian Mountains, and in the Gulf States.

SUNSHINE AND CLOUDS

There was abundant sunshine over the greater part of the country from the Rocky Mountains eastward, save over the more northern districts where locally much cloudy weather was the rule. The Southeastern States had an unusual number of sunshiny days, and most of the Southwest had abundant sunshine.